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A Day In the Life of a Nuclear Criticality Safety Analyst

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Disclaimer

- Not everyday in NCS is the same
- Not everyone's experiences are the same
- This is a high level overview of some of my personal experiences

NCS at LANL

- Nuclear criticality safety differs in no intrinsic way from industrial safety
- Integrated Safety Management
 - *Define the Scope of Work*
 - *Analyze the Hazards*
 - *Develop and Implement Hazard Controls*
 - *Perform Work within Controls*
 - *Provide Feedback and Continuous Improvement*
- Safety at the “Floor Level” implemented by
 - Employing people with the right safety attitude
 - Effective training
 - Effective procedures
 - Seeking guidance from the appropriate safety professionals

What is Nuclear Criticality Safety?

- The art and science of preventing criticality accidents
- Ensuring that operations personnel makes it home alive at the end of the day



6:30 am roll into work

- Check NCS Database for new works assigned
 - Repository of work requests from operation personnel
 - Flow down from management

Examples:

- CSEDs (Criticality Safety Evaluation Documents)
- Procedure Reviews
- FMORs (Fissionable Material Operational Reviews)

CSEDs

- Revision to existing CSED
 - Moving equipment from one glovebox to another
 - Little or no change to CSP controls
- New CSED development
 - New material form needed in location
 - Larger mass limits needed in location
 - Completely new process never previously performed

CSEDs Continued

- New CSED development
 - Usually required analysis of the process
 - Use of MCNP
 - Use of handbook data
 - Interaction with Ops personnel
 - Create controls easy for Ops personnel to follow

Derivation of Controls

- Controls are developed to limit process parameters important to criticality safety
 - Mass
 - Absorption
 - Geometry
 - Interaction
 - Concentration/ Density
 - Moderation
 - Enrichment
 - Reflection Volume

Procedure Reviews

- Change in existing process
 - Opening material in a place that it used to be prohibited
- New process
 - Performing a completely new operation in glovebox

NCS looks for concurrence with CSED description of process and CSP controls

FMORs

- Two part process
 - In office
 - Paperwork
 - Analyze documents in database pertaining to location
 - Field
 - Interact with Ops personnel
 - Make sure my understanding of process is true

How is Criticality Safety Typically Practiced?

- Operations personnel propose a new process
 - Change in an existing process
- NCS staff analyze the system
 - Use of MCNP
 - Use of handbook data
- NCS staff work with Operations and Engineering staff
 - Develop controls on the process to ensure safety
 - Develop controls that are easy for Ops to work to

A Day in the Life

- Interaction with Operations Personnel
 - Form working relationships
- Observe Operations
 - Learn processes
- Training (Providing and Receiving)
 - Interact with Operation Personnel in classroom setting
- Create New/ Updated Operations Analysis
 - Work close with Operations personnel

How to Obtain a Future in NCS



Other NCS Personnel Experiences